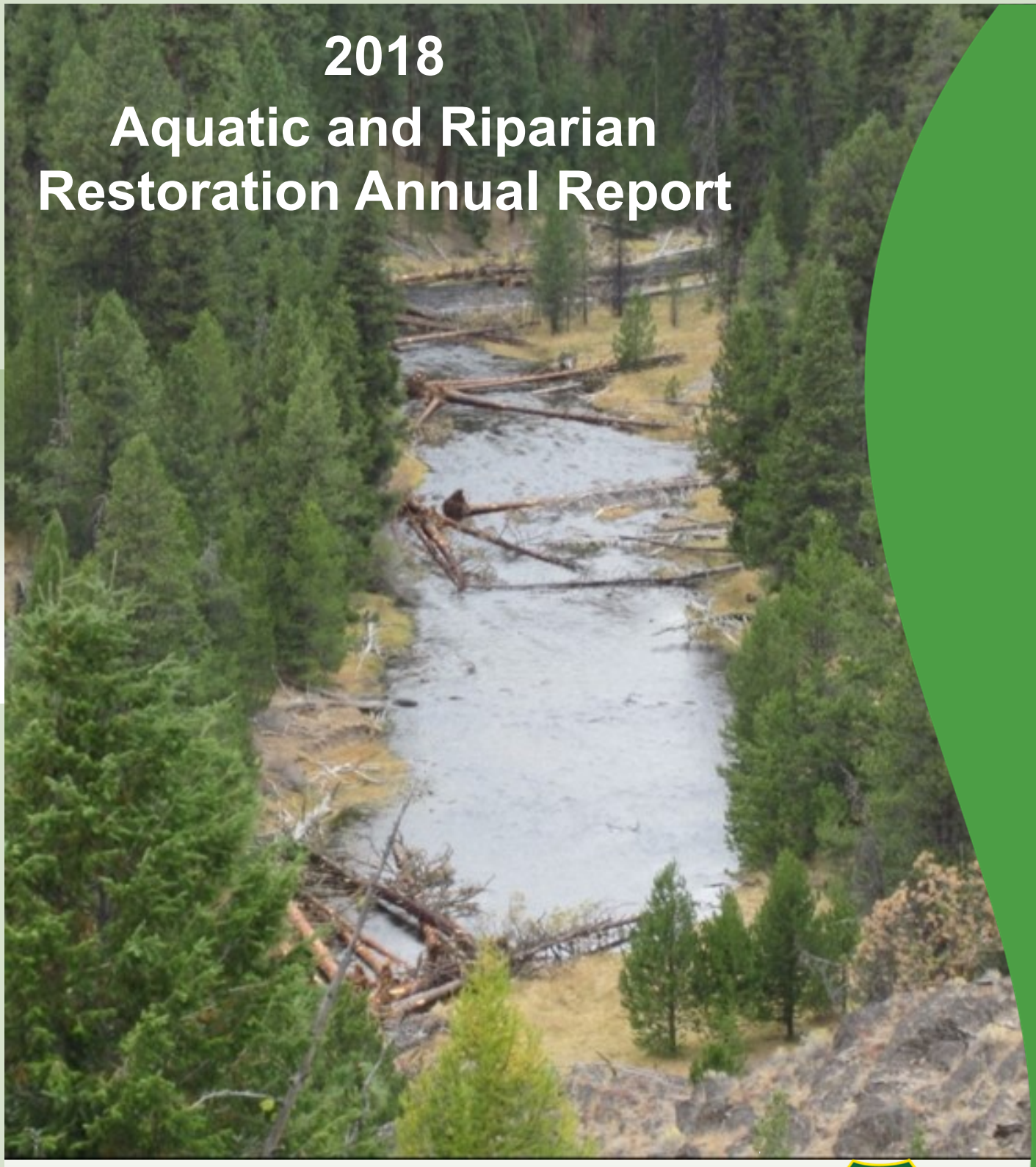
2018
Aquatic and Riparian Restoration Annual Report

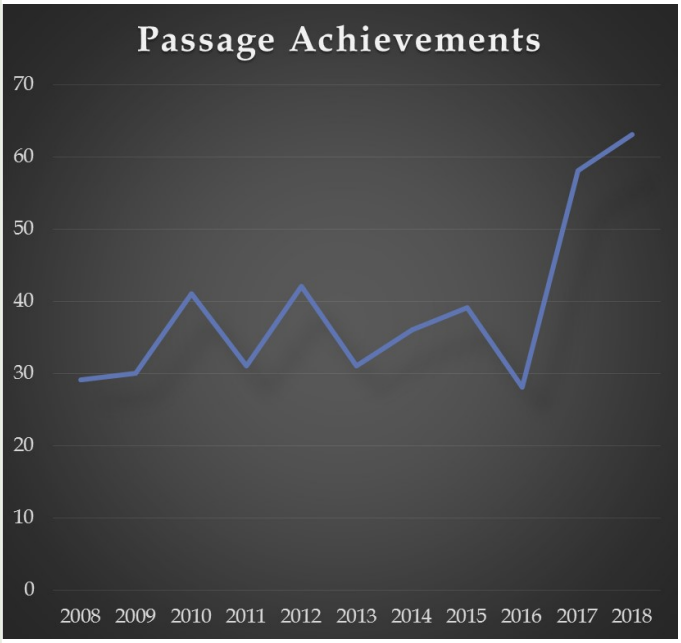


USDA Forest Service
Pacific Northwest Region

for the greatest good

USDA Forest Service Pacific Northwest Region 2018 Aquatic and Riparian Restoration Annual Report

In 2018, we celebrated several high profile aquatic restoration achievements and many of them are captured in this report. In our opinion, one our greatest 2018 achievements was the completion of our Regional Fish Migration Barrier Database, documenting all of our known human-caused fish barriers in the Region. With this tool, we can identify the location of barriers and when we fixed them, increasing our accountability. We are currently using it with other data to prioritize the treatment of barriers at the Regional, Forest, District, or Watershed scale. We have approximately 3,600 barriers remaining in the Region and have been averaging approximately 30 fixes per year over the last decade.



However, we are accelerating the treatment of those barriers with 59 in 2017 and 63 in 2018, another outstanding regional restoration achievement. We believe this reflects our realization of the importance of aquatic organism passage, watershed health, and road user safety and the strong internal partnerships we foster between agency Engineers, Fish Bios, and Hydrologists that make it happen. In addition, these achievements indicate the great interest in fish passage and support we receive from our partners. Thanks for the great support and work!

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Colville National Forest
West Branch LeClerc Creek

The West Branch LeClerc Creek is home to some of the highest quality Bull Trout and Cutthroat Trout habitat on the Colville National Forest. Reconnecting and reactivating floodplain, restoring historic channel and valley function, and reconnecting fish passage at two dam sites were essential to the restoration of the watershed.

Pre-project drone image on West Branch

Post-project drone image *on West Branch LeClerc*

Restoring floodplain grade to historic elevation

Log crib dam removal restoring passage to 18 miles upstream

Restoration included transporting and placing 650 trees with root wads attached, moving approximately 15,000 cubic yards of berms from the floodplain, re-establishing channel function in a 0.5 mile reach of stream adjacent to a historic (1920 era) Diamond Match Company mill site, blasting two log dams to restore fish passage to 18 miles of fish habitat, placing nearly 200 trees as LWD restoring natural stream hydrology, channel bed and bank dimensions, and upstream fish migration at those locations. The Lands Council and the Forest Service are collaborating with the large wood placement component of the project.

The final phase of this project is to place 500 trees by helicopter in the 3 miles of the stream during the Fall of 2019.

For more information on this project and other restoration projects on the Colville National Forest, contact Karen Honeycutt, Natural Resources Program Manager (Fisheries, Wildlife, TES, Soil and Water) at 509-684-7224.

Columbia River Gorge National Scenic Area
Bridal Veil Creek Restoration

This project was designed to improve water quality and restore stream function in the Bridal Veil Creek-Columbia River Priority Watershed as designated by the Watershed Condition Framework. The project decommissioned a 0.75-mile segment of forest road, removed failed stream crossings, reestablished floodplain connectivity, and restored aquatic habitat.

The project was on National Forest System lands, immediately adjacent to Bridal Veil Creek, a fish-bearing, perennial tributary to the Columbia River. It addressed a road that crossed Bridal Veil Creek five times within the 0.75-mile project site. The western-most portion of the road was not passable by vehicles for years due to the recurring washout of a stream crossing, resulting in approximately 0.1 miles of the road gullying out. The road was a chronic source of sediment to the stream and downstream aquatic habitat.

reconnection to Bridal Veil Creek. The relic stream channel re-connection also included partially filling the incised stream channel to the floodplain elevation to restore low stream flows in the relic (i.e. historic) stream channel reaches.

Stockpiles of approximately 200 pieces of large wood left from Eagle Creek Fire hazard trees were utilized to enhance fisheries habitat and reconnect the floodplain along Bridal Veil Creek and along the decommissioned road to prevent vehicular access. The large wood was added to the stream channel in locations that are currently lacking large wood, mimicking natural conditions. Large wood and road fill material were also used to aggrade incised, straightened reaches of Bridal Veil Creek, returning stream access to side channel habitat, and Bridal Veil Creek was re-routed to re-activate relic sections of the original stream channel.

Photos showing floodplain reconnection and berm removal (Before and After).

The project included re-contouring the western most section of the road that “blew-out” over ten years ago, including removing a large earthen berm and de-compacting the remaining portion of the road. Five stream crossing structures, totaling six culverts, were removed. Additional cross-drain culverts were also removed. At three other locations, where relic stream channels cross the existing roadbed, road fill material was removed to allow stream channel and floodplain

If you have questions about this project, please contact Diane Hopster, Hydrologist, at 541-308-1732. If you have questions about other projects on this forest, please contact CRGNSA wildlife and fisheries biologist Brett Carré at 541-308-1718.

Deschutes National Forest
Big Marsh Restoration

During the summer of 2018, the Deschutes National Forest, in partnership with the Upper Deschutes Watershed Council and Oregon Watershed Enhancement Board, implemented the most recent phase of wetland restoration in Big Marsh. Big Marsh had been a privately owned property used for grazing until the 1980's. During the time of private ownership, two drainage ditches were excavated along the perimeter of the east and west margins, converting a historic wetland to a pasture. The Deschutes NF acquired this property and has been working at this site since the late 1990's. Our efforts have been to reverse the degradation and restore wetland characteristics to improve the ecological function, restore wetland hydrology and improve habitat conditions for native species such as the Yellow Rail and Oregon Spotted Frog.

This year's effort was focused at the upstream extents of the east and west ditches. Approximately 350 meters of ditch line on each side were filled with adjacent side cast berm material and lodgepole pine trees growing on the berm. Filling of these drainage ditches reduces the efficient discharge of flow from the marsh and increases the residence time for water. As a result, the shallow groundwater level is increased, rewetting the wetland.

Additionally, seven culverts were removed from a closed road that parallels the west margin of the marsh. These culverts conveyed seven small, spring water streams across the road and into the marsh. Road fill was pulled back, large wood was added, and the sites were re-contoured to match the valley conditions above and below. FY18 restoration activities were accomplished with the assistance of the forest road crew, who operated the heavy equipment.

Filling of drainage ditches required a significant salvage effort to remove Oregon Spotted Frogs from harm's way. Frog salvage was accomplished through a combined effort of wildlife, botany and fisheries personnel. Over 3,000 Oregon Spotted Frogs were relocated during this effort.

Relic wetlands rewetted following West Ditch obliteration.

For more information about this project on the Deschutes National Forest, contact Paul Powers, District Fisheries Biologist at 541-408-7465 or Joan Kittrell, District Wildlife Biologist at 541-433-3200. For other restoration projects on the Deschutes National Forest, contact Jason Wilcox, Fisheries Program Manager at 541-383-5534 or Jason Gritzner, Forest Hydrologist at 541-383-5537.

A segment of West Ditch was filled and pine trees spread over its surface, returning groundwater to the ground surface.

Fremont-Winema National Forest
Upper Sycan Habitat Restoration

The Upper Sycan Habitat Restoration Project is a multi-year effort started in 2016, addressing aquatic and riparian impacts along a 2.5 mile reach of the Sycan River, in the Upper Sycan River watershed. It is within a Priority Watershed on the Fremont-Winema National Forest and restoration actions are guided by an associated Watershed Restoration Action Plan. The project area also lies within a Wild and Scenic River corridor and is designated critical habitat for Bull trout. Other important species include Redband Trout and Miller Lake lamprey. The project focused on adding large woody material to create habitat complexity and points of scour in the lower mile of the project reach. Large wood material was removed from forested stands within 300 feet of the stream, targeting dead or dying lodgepole pine. The material was used to create small log jams, typically on meander bends.

Upper Sycan Project before (above) and after (below) project implementation.

Additional components of the project are the creation of floodplain terraces, stabilization of streambanks, and revegetation of riparian areas with whole willow transplants and sedge/sod mats. This will improve flow access to floodplains. In addition, livestock were excluded from approximately one mile of stream and riparian area with the construction of a 2-strand high tensile wire electric fence. This work was conducted in cooperation with the Forest Range Program and the livestock grazing permittee to further assist in the recovery of the recently restored area.

The project was implemented under the Forestwide Watershed Restoration Programmatic Environmental Analysis, allowing the Forest to conduct more restoration due to salary savings incurred through decreased repetitive project planning. An overall environmental analysis was conducted for the entire Forest, including the analysis of the effects from this type of project.

The Upper Sycan projected was implemented through the use of a contract and Interagency Road Crew and with support of the project from the permittee (Withers Ranch) and Forest Range Program.

For more information on this project contact Rich Pyzik, Eastside Fish Biologist, 541-943-4440. For other aquatic restoration projects on the Fremont-Winema Forest, contact Phillip Gaines, Forest Fish Biologist, 541-947-6258 or Don Kozlowski, Forest Hydrologist, 541-947-6284.

Gifford Pinchot National Forest
Legacy Roads Project

In 2018, the forest replaced a set of undersized culverts that were damaged during a 2015 flood event when a large debris flow moved down the valley slope, depositing rock and large wood on two roads. Some large wood pieces were deterred at the road-stream crossings rather than delivered to Yellowjacket Creek where the large wood could become instream habitat structure. The 2015 flood resulted in almost $10 Million of damage to the Gifford Pinchot Forest Road system with activation of many debris flows in concentrated areas. As climate change results in warmer storm periods, the activation of natural debris flows in steep high elevation areas will become more frequent and be transported far distances to the bottom valleys where high use roads exist. These activated debris flows are expected to continue to transport boulders and large wood.

Example of large wood prevented from entering Yellowjacket Creek.

The project removed the damaged culverts and more than 1300 cubic yards of landslide material. Open box culverts (96" span 72"rise) with metal grates were constructed and a 200 foot stream course varying between 15-29% gradient established between the two roads. The open box culverts with paved slopes will allow more of the smaller sized sediment to move through the road crossing during bankfull events, and, during higher flows, allow more large wood material to transport over the structures into Yellowjacket Creek. The metal grate allows structure clearing of large sized deposited sediments, minimizing costs of future post storm repairs.

The road-stream crossing is sized to accommodate smaller landslide movement during high flows. The new crossings have an improved probability that large wood could move over both road crossings and be delivered to Yellowjacket Creek, a fish bearing stream. The new crossings also create equipment access via the metal grate to deposited landslide material within the culvert. The total cost of these two sites was $818,852, with about 50:50 Legacy Roads and ERFO funds.

For more information regarding aquatic restoration projects on the Gifford Pinchot National Forest, please contact Ruth Tracy, Soil and Water Program Manager, 360-891-5112.

Above: Completed open box culverts with metal grates.

Malheur National Forest
Malheur River Large Wood Placement

The Malheur River Large Wood Placement Project area is located approximately 25 miles south of the town of John Day, Oregon. The Malheur River originates in the Strawberry Mountain Wilderness and flows to the Snake River near Ontario, Oregon. The specific project area segment of the Malheur River is designated as critical habitat for Threatened Bull Trout, and Oregon Department of Environmental Quality has listed it as not meeting temperature and dissolved oxygen standards.

Currently its aquatic habitat is considered to be in poor condition with the channel being too wide and simplified because of past management practices, including overgrazing, logging, and splash dams. At fewer than 2 pools per mile, the Malheur River is seriously lacking in this important habitat feature. Although this is not a National or Regional Priority Basin, its recovery is critical for the survival of the Malheur River Bull Trout.

In 2012, the Malheur National Forest solicited the services of the Regional Restoration Assistance Team. Upon assessment, a decision was made to pursue funding to start to address limiting habitat features that were identified in the Bull Trout Recovery Plan. The three top limiting factors were: effects from non-native brook trout, water quality, and habitat degradation. The Malheur River Large Wood Placement Project starts to address two of those limiting factors, water quality and fish habitat degradation. In 2015 a partnership was formed with the Malheur Watershed Council. Early in 2018, the Forest completed a Wild and Scenic Rivers Section 7 Analysis and received Regional Forester approval to move forward with the project.

Overall, the primary objectives were to improve stream channel and floodplain connectivity, narrow the stream, create spawning and rearing sites, reduce elevated summer stream temperatures, and improve pool habitat quantity, quality, and complexity by providing more complex, deep pool habitats.

In fall of 2018, the Prairie City Ranger District completed 3.5 river miles of instream enhancement within the Malheur River. A helicopter was utilized to strategically place 453 pieces of large wood into the channel/floodplain to simulate the natural recruitment and accumulation of complex large wood jams. A total of 59 wood jams were created, with each jam including 3 to 25 trees per complex. Other benefits of the project included thinning 130 acres of overstocked forest stands, using the byproduct of that work as the wood source for the river project.

Efforts like the Malheur River Large Wood Placement Project cannot be completed without dedicated partnerships with both public and private entities. Specifically, the Malheur Watershed Council (MWC) was instrumental in securing project funding ($217,000)

Before Restoration

After Restoration

through the Oregon Watershed Enhancement Board (OWEB) as well as assisting in contracting and monitoring of the project. Total cost of this project was $467,000.

For more information on aquatic restoration projects on the Malheur National Forest, please contact Steve Namitz, Fisheries Program Manager at 541-575-3167 or Tom Friedrichsen, Forest Hydrologist at 541-573-4329.

Above: Post Restoration

Above: *Reach Overview of Malheur River after Restoration*

Above: Implementation of tree placement.

Mt. Baker-Snoqualmie National Forest
Aquatic Organism Passage Restoration

This project includes 5 separate road-stream crossing sites in four separate watersheds: Straight Creek tributary at Forest Service Road (FSR) 2500, Diobsud Creek tributary at FSR 1050, NF Stillaguamish River tributary at FSR 2800 and two NF Skykomish River tributaries at FSR 6300. The Straight Creek site is within a Priority Watershed and is considered a Watershed Condition Framework essential project in the Circle Creek Watershed Restoration Action Plan. All watersheds where these projects occur support federally listed Chinook Salmon, steelhead and Bull Trout as well as other salmonid species, such as Coho Salmon and Coastal Cutthroat Trout. Spatially, these tributaries function mostly as off-channel habitat allowing for fish migration and use out of larger stream and river habitats for rearing and foraging.

In addition to upstream passage gained and aquatic habitat restored, roads at each of these 5 AOP project sites were known to chronically interact with these streams. As such, downstream channel impacts and sediment generation occurred at varying high flow intervals. These impacts carry downstream affecting habitat function, fish spawning success, and water quality.

The tributary to Straight Creek is low gradient both below and above the 2500 road crossing. The old undersized round culvert was replaced with a bottomless arch with the elements of the channel gradient, cross section, bed form, and particle distribution matched to what above and below streams conditions were.

Tributary to Straight Creek at FSR 2500. Example of important off-channel habitat conditions.

Construction at two sites, FSR 2800 (a bottomless arch) and 1050 (a box culvert), were completed in October 2018. Construction at the 2 sites on FSR 6300 (bottomless box culverts) will occur in July/August 2019. As with Straight Creek, the NF Stillaguamish tributary also is a low gradient stream that provides important off-channel habitat to Coastal Cutthroat Trout. The tributaries at Diobsud Creek and NF Skykomish River are slightly larger higher gradient step pool systems and provide spawning habitat for steelhead and Coastal Cutthroat Trout.

Tributary to Straight Creek at FSR 2500 at the bottomless arch culvert outlet.

Tributary to Diobsud Creek at FSR 1050 at the box culvert inlet (during construction).

For more information on this project and other aquatic restoration projects on the Mt. Baker-Snoqualmie National Forest, contact Richard Vacirca, Fisheries Program Manager at 425-783-6040.

Mt. Hood National Forest
South Fork Clackamas River AOP

In 2018, the Mt. Hood National Forest, Clackamas River Ranger District Fisheries Program completed a large scale culvert replacement project on the South Fork Clackamas River, opening 4 miles of fish and aquatic organism habitat. The project was funded and supported by cooperative efforts from Oregon Department of Fish and Wildlife, Eugene Water and Electric Board, Clackamas Stewardship Partners, and the Portland General Electric Clackamas River Mitigation Fund from the 2015 application cycle. This project had two phases. Phase 1 was completed in 2016 with mapping and design by the Mt. Hood National Forest Engineering group and Phase 2 concluded in 2018 with construction.

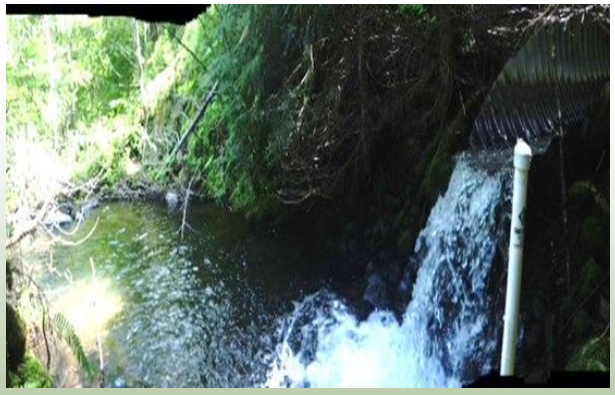
The existing culvert was undersized and did not meet design standards to accommodate normal annual flows within the watershed. The inlet was bent upwards, which resulted in large amounts of sediment and debris build up partially clogging the culvert. The outlet was perched eight feet above the stream bed which did not allow for native fish or other aquatic organism passage. Additionally the road bed, regularly used by the public, was cracking and showing signs of decomposition and failure.

The road-stream crossing was replaced with an open arch structure able to withstand a 50 year flood event and reduce the risk of catastrophic failure. The project opened 4 miles of stream habitat, improved passage for all aquatic organisms, and will decrease downstream sedimentation.

Funding for the project included $271,426 from the PGE Clackamas River Mitigation fund, $184,565 from the PGE Resident Fish Mitigation fund, $228,980 from retained receipts funds, and $20,000 from EWEB PIP (for design work). The total cost of the project was $704,971.

For more information on this project or other aquatic restoration projects on the Mt. Hood National Forest, contact Jane Dalgliesh, Supervisory Fish Biologist, at 503-630-8798 or Todd Reinwald, Forest Hydrologist, 503-668-1769.

Post project: newly installed open bottom arch with stream simulation.



Pre-project conditions

Ochoco National Forest
McKay Creek Floodplain Restoration

The primary goals of this multi-year project were to improve steelhead and Redband Trout spawning and rearing habitat in McKay Creek , a Priority Watershed, by reconnecting the main channel to its historic floodplain, retaining water from higher flows for a longer period of time, and adding large wood and channel pattern habitat complexity. An experimental approach was taken over this 3-phase project to evaluate a few slightly different restoration techniques and determine which technique(s) provide the greatest ecological return for this particular hydro-physiographic area.

Phase I of implementation, in 2016, created small inset floodplains in incised reaches of McKay Creek and habitat enhancement through the addition of wood and enlargement of pools. Observation of above average spring runoff, and subsequent recession of high flows in the spring of 2017, determined this approach did not adequately address the hydrology and retention of water for slow release during low flow periods.

Pre-project view of channel reconnection site.

Phase II of implementation in 2017 was designed to provide more groundwater storage in an effort to restore perennial flow. This phase included a Stage Zero restoration approach with channel aggradation and woody material placement and plantings. The below average precipitation during the winter and spring of 2017/2018 resulted in most of McKay Creek losing surface water by early July. This included the Phase II project reach; however, improved soil moisture was observed across the entire valley width in this area and riparian plantings from May 2018 experienced high survival rates and vigorous growth during a very dry summer and fall. Downstream of the Phase II Stage Zero reach, a small stretch of creek maintained perennial flow.

Phase III of this project, implemented during the summer of 2018, applied a more actively constructed hybrid approach. This involved Priority 1 restoration techniques to raise groundwater levels and reset geomorphologic functioning, complemented by constructing immediate instream spawning and rearing habitat, and providing deep cold water summer refuge for fish. A single thread channel was designed, corresponding to past historic channel features observed using LIDAR mapping and reference reach data, and cleaned and sorted gravel was added to the channel. This channel focused on a defined low flow channel and underbuilt bankfull/floodplain surfaces to encourage flows to readily access a complex floodplain system. A series of constructed wetlands were located directly upstream of each of the lateral scour pools in the meander bends of the main channel to feed these pools with groundwater in order to provide summer refuge for fish.

Post project view of channel reconnection to historic meandering channel.

Another major component of Phase III was reconnecting a historically diverted intermittent tributary to McKay Creek . A longer culvert was installed to reconnect this tributary to the historic channel and reactivate the floodplain and a sizable area for recharge. In addition to the above work, approximately four miles of large wood was added to both Little McKay and McKay Creeks, both upstream and downstream of the project area, to increase habitat complexity and slow high flows.

Forest Service specialists are undertaking an active monitoring program as well as working with students in a place-based conservation education program with local schools. Funding for this project was provided primarily from Portland General Electric Pelton-Round Butte Dam upstream mitigation funding, USFS appropriated funds, as well as funds through Title II and One Tree Planted contributions.

For more information about this project on the Ochoco National Forest, contact Jon Kochersberger, District Hydrologist at 541-416-6486 or Jennifer Mickelson, District Fisheries Biologist at 541-416-6485. Forest-wide information is available through Jason Wilcox, Forest Fisheries Biologist at 541-383-5534 or Jason Gritzner, Forest Hydrologist at 541-383-5537.

McKay Creek reconnected to historic floodplain surfaces after being raised six feet in this section.

Okanogan-Wenatchee National Forest
Upper White Pine Restoration

In 2018, the third and final phase of the Upper White Pine aquatic restoration project was completed. The project is located along Nason Creek, a tributary to the Wenatchee River, and provides critical habitat for listed Columbia River Bull Trout, Upper Columbia River steelhead, and Upper Columbia River Spring Chinook salmon. Legacy impacts to Nason Creek include channel straightening and levee construction to protect the Burlington Northern Santa Fe (BNSF) railroad line, Washington State Highway 2, and the Chelan Public Utility District transmission line which parallel Nason Creek on both banks. Habitat modification, stream channel constriction, and loss of floodplain have also occurred. In 2014, the Wenatchee River Ranger District began working with partners from Chelan County Natural Resources Department (CCNRD), the Yakama Nation, the Bureau of Reclamation (BOR) and Chelan County Public Utility District (CCPUD) to implement the Upper White Pine restoration project.

Phase 2 in 2017: using large wood structures to enhance habitat complexity.

Phase 1 of the project was completed in 2016 and included the relocation of 4,000 feet of CCPUD transmission line out of the floodplain to a more suitable and accessible roadside location. Phase 2 in 2017 consisted of the re-alignment and construction of 1,500 feet of Nason Creek channel including pool and riffle construction, large wood structures incorporated into stream banks to provide habitat complexity, and an off-channel alcove to provide high flow refugia for aquatic species. The final phase in 2018 began with the construction and restoration of the floodplain to allow inundation to approximately 20 additional acres during 10-year flow events, and the removal of 2,500 feet of levee and rip rap that constrained the straightened the stream channel and simplified aquatic habitat. Over 4,500 plants were planted and 12 acres reseeded in order to revegetate the stream banks and floodplain.

Post-implementation surveys identified steelhead and Chinook Salmon use of the Upper White Pine reach, immediately following completion of construction. Spring Chinook redds were documented in the restored section, which has not occurred within this reach of Nason Creek since the channel alteration decades before.

Aerial view of Nason Creek before (top) and after (bottom).

For more information on this project or other aquatic restoration projects on the Okanogan-Wenatchee National Forest, contact Emily Johnson, Fisheries Program Manager at 509-664-9326 or Molly Hanson, Forest Hydrologist, 509-664-9330.

Olympic National Forest
Legacy Road Decommissioning

In 2010, the Calawah River was selected on the forest as a Focus Watershed for restoration, and identified the Sitkum subwatershed as the first priority for treatment. Drawing from watershed analyses and watershed restoration plans for the Calawah, initial projects were identified in the 2012 Sitkum Watershed Restoration Action Plan to improve watershed condition. The project list was supported by the Quileute tribe and the North Pacific Coast Lead Entity for Salmon Recovery. Due to high road densities, naturally unstable slopes, and a history of previous road failures in the area, decommissioning of FSR 2912 and its associated spur roads were identified as a large-scale essential project. In 2017, work was completed on FS 2912-060, -063 and -050 roads. In 2018, essential project work was completed in the entire road network, including the decommissioning of 2.3 miles of road, removal of 28 culverts, and removal of nearly 40,000 cubic yards of material to restore natural drainage swales and complete slope pull-back. Work included constructing permanent drainage features and slope stabilization using native seed, straw, and locally derived shrub cuttings. Finally, small trees and slash produced during decommissioning were scattered over the disturbed surface for additional erosion control.

Pre-work: This road is in the Sitkum Priority Watershed and addressing its effects was part of a larger effort to improve the watershed condition as well as work towards achieving a sustainable road system.

This integrated project was designed to restore natural hydrology, improve soil productivity, reduce hydrologic connectivity with roads, reduce mass wasting risk, restore native plant species, reduce road maintenance costs, and reduce sediment delivery to the North Fork Sitkum River. The Sitkum River supports native runs of summer and winter run steelhead, fall Coho, summer and fall Chinook, river-run Sockeye, and resident and sea -run Cutthroat Trout.

Completed Project: Road Decommissioned – the unstable road fill slope was pulled back to restore natural state

A total of 2.3 miles of road storage and decommissioning was completed in 2018. Approximately 3.3 miles of associated tributary stream habitat were enhanced. These road treatments are expected to restore natural drainage patterns and prevent large scale mass wasting events commonly associated with negative impacts on fish habitat from unmaintained roads and culverts on steep and unstable slopes. In coming years, the revegetation of the disturbed areas will continue to increase the productivity and stability of the site, and reduce surface erosion.

For more information on this project or other aquatic restoration projects on the Olympic National Forest, contact Dana Butler, Watershed Program Manager at 360-956-2280 or Tammy Hoem Neher, Fisheries Program Manager at 360-956-2293.

Rogue River-Siskiyou National Forest
Dunn Creek Restoration

The Dunn Creek Restoration Project was completed in partnership with the Illinois Valley Watershed Council. The project was deemed an essential project within the East Fork of Illinois River Watershed Restoration Action Plan. This Priority Watershed provides high quality habitat for federally listed Southern Oregon and Northern California Coasts (SONCC) Coho Salmon, steelhead, and resident salmonids. The Illinois subbasin is a major tributary to the lower Rogue River and represents some of the highest intrinsic potential in the Rogue River basin for SONCC Coho Salmon.

The project area has a history of intensive gold mining, logging, and streamside road building leaving habitat in the lower reaches of Dunn Creek simplified, entrenched, and with limited natural recruitment potential for additional large wood. The project area can be characterized as low to moderate gradient with moderate intrinsic potential for SONCC Coho Salmon. A multi-year implementation strategy completed work in 2016, 2017, and 2018 to address the limiting factors described above and to remove legacy habitat structures from the past.

Dunn Creek log structure

The main objectives in 2016 and 2017 were to add large wood structures to the mainstem and side channels of Dunn Creek in order to dissipate energy during high flows, capture spawning gravel, and to provide cover during high and low flow conditions. Trees were obtained for the project from an unsold, second-growth timber sale unit that was not harvested due to economic reasons. The standing live trees are typically dug out and pushed over with an excavator, then cut into 35' sections to transport to the project area. Over 100 trees were marked and utilized for the project.

Deconstructing legacy habitat structures in Dunn Creek.

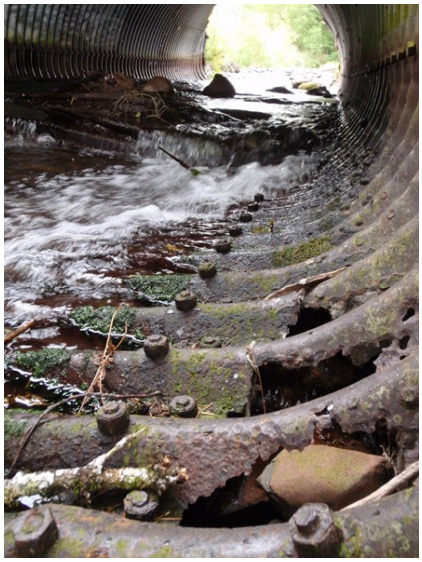
A secondary objective in 2017 was to remove legacy fish habitat structures that were perpetuating a degraded channel condition. Deconstruction included removing all cable and anchoring rebar from legacy structures and reconfiguring the wood to encourage a meandering thalweg. A combination of techniques were used to help the structures withstand the intensity of the Siskiyou flow regime – including using rock as ballast, interlacing structures into existing streamside vegetation, and keying logs into the streambank. More than 100 inches of annual precipitation and a "flashy" geology require that structures (and fish) can withstand intense flow events with regularity. Our structures were spatially placed within the channel to direct a portion of stream flow energy laterally instead of longitudinally. The structures will aid in capturing spawning gravels, which are lacking in the project reach, as well as provide summer and winter rearing habitat for salmonids.

Activities in 2018 included constructing a winter flow side channel that will offer additional spawning, winter rearing, and summer rearing habitats for anadromous salmonids and Pacific Lamprey. The side channel was approximately 1,200' long and contained numerous large wood structures. While primarily a winter flow side channel, groundwater inputs will likely offer excellent summer rearing habitat for Coho Salmon during low flow conditions. Project partners include the Illinois River Watershed Council, SunStar Country Club, and Camp's Custom Excavating, Inc. Total project cost was approximately $250,000.

For more information, please contact Steve Burns, Forest Fisheries Biologist, 541-618-2052 or Chris Park, Forest Hydrologist, at 541-471-6761.

Siuslaw National Forest
Boulder Creek Restoration

Since 2010, over 260 barriers to fish passage throughout the Tillamook-Nestucca watershed were identified and a strategy called the Salmon SuperHighway was developed to maximize conservation benefits and link projects and partners together across the watershed. In the last several years, over 14 fish passage barriers have been replaced with AOP structures or completely removed, opening up access to over 50 miles of key habitat. The Boulder Creek – Schrock Aquatic Organism Passage Installation Project removed the last fish passage barrier on main-stem Boulder Creek (a tributary to the Nestucca River) and was a high priority project for the Salmon SuperHighway initiative.



Before photo of Boulder Schrock crossing rusted culvert bottom.

This project replaced a nine-foot wide undersized culvert with a 40-foot wide concrete bridge across Boulder Creek. Implementing this project improves fish passage to over four miles of habitat for threatened Coho Salmon, Chinook, steelhead, Cutthroat Trout, and Pacific Lamprey. It will improve natural sediment and nutrient transport, and mitigate the risk of culvert failure in the event of large storms. By increasing critical spawning and rearing habitat availability in the Boulder Creek watershed, salmonid populations will be more resilient to future impacts from stochastic events, climate change, or management impacts. In addition, this project is an important piece of the Salmon SuperHighway fish passage partnership, which has a goal of improving fish passage throughout the entire Nestucca watershed. The project was a collaborative effort led by the Nestucca-Neskowin Sand Lake Watersheds Council to improve fish passage in the watershed. The Siuslaw National Forest assisted with engineering, hydrologic and geomorphic assessments, as well as project oversight during implementation. Other partners included the US Fish and Wildlife Service, Tillamook County Public Works, Cascade Pacific Resource Conservation and Development, Natural Resource Conservation Service, and Oregon Department of Fish and Wildlife. For more information, please contact Brandy Langum, Forest Fisheries Biologist, Siuslaw National Forest, at 541-750-7034 or Kami Ellingson, Forest Watershed Program Manager, at 541-750-7101.

Before photo of Boulder Schrock crossing (top) and after photo (bottom) of bridge installed with stream simulation design.

Umatilla National Forest
Swale Meadow Stream Restoration

A down-cut section of Swale Creek was reconstructed to improve floodplain connectivity (rewetting an adjacent meadow), floodplain complexity, and water retention. Project design and technical oversight during implementation were completed by the Forest Service Enterprise team. The project implementation was accomplished by a team of district biologists, a hydrologist, and a fire crew, in partnership with the North Fork John Day Watershed Council. An added grant from the watershed council provided a week's worth of labor for a three-person Youth Conservation Corp (YCC) crew and crew leader.

Pre-project implementation.

The project was designed to slow stream flow, decrease channel and bank erosion, promote sediment deposition and streambed aggradation, and increase groundwater exchange in the area. The project includes placement of large and small wood pieces to slow and encourage sediment deposition. One major eroding bank and several minor eroding sites were stabilized within the project area. To slow the water and allow streambed rebuilding in a downcut stream reach, three complex large wood structures were installed at the lower end of a meadow, using trees selected from the adjoining hillslopes at the edges of the meadow.

This project is expected to facilitate more out-of-bank flows in this section of the Swale Creek meadow system, bringing more water, sediment, and nutrients to the floodplain meadow and thereby improving conditions for riparian vegetation and ultimately improve late season habitat conditions for young steelhead in Swale Creek in and downstream of the meadow.

For more information, please contact Kathy Ramsey, Forest Fisheries Biologist, Umatilla National Forest, at 541-278-3339 or Brien Park, Forest Watershed Program Manager, at 541-278-3716.

Post implementation.

Youth Crew moving woody material to design locations.

Umpqua National Forest
Steamboat Creek Instream Restoration

Steamboat Creek provides aquatic refuge for the majority of the summer steelhead found in the North Umpqua Basin. In addition, it provides habitat for winter steelhead and native resident fish such as Cutthroat Trout and native, non-game species including Longnose Dace, Speckled Dace, sculpin, and likely Pacific Lamprey. Water from Steamboat Creek helps sustain downstream populations of Oregon Coast Coho and spring Chinook Salmon.

This project targeted Steamboat Creek stream reaches with the highest diversity of native aquatic species and most potential for response. Many of these reaches had little to no wood present. They were scoured to bedrock or dominated by large size substrate. All of this limited aquatic habitat potential. T

he flashy nature of stream flows after precipitation events in the area and transient rain on snow zone watersheds require innovative approaches such as pulling large riparian trees into the stream channel for effective, long term habitat development.

The Steamboat Creek Instream Restoration Project restored miles of anadromous fish habitat by constructing large, complex instream structures in tributaries and the mainstem of Steamboat Creek. Whole trees were tipped into the stream at channel nick points to develop spawning beds, velocity refuges, pools, complex rearing habitat and floodplain connectivity.

The project was funded through the North Umpqua Hydropower Mitigation Fund.

For more information on this project and other restoration projects on the Umpqua National Forest, contact Bob Nichols, Fisheries Biologist at 541-825-3134 or Joe Blanchard, Forest Watershed Program Manager, at 541-957-3356.

Project site prior to log placement.

Project site after log placement.

Wallowa-Whitman National Forest
West Chicken Creek AOP

The Upper Grande Ronde River subwatershed is a high priority area for the Forest Service and partners. It is an important subwatershed for Chinook Salmon, steelhead, Bull Trout, and other important native fish and there has been an impressive history of aquatic habitat improvement efforts in this area. An important part of this work has been aquatic organism passage (AOP) projects on fish bearing streams and, to date, the majority of this work has been conducted on maintem road-stream crossings. The Wallowa Whitman Forest is beginning to address those road crossings in tributary streams now, in a continued effort to improve the condition of the subwatershed.

In 2018, the Forest Service implemented an AOP project upgrading a culvert on Forest Service Road 5175, where it crosses West Chicken Creek. The total cost for the project was $61,653 which was funded by Legacy Roads funding. The existing culvert was a standard round 24 inch pipe and was replaced with a bottomless arch with a natural streambed surface. With the implementation of this project, the Chicken Creek subwatershed will be reported as “improved” in 2019 under the Watershed Condition Framework.

For more information on this project and other restoration projects on the Wallowa-Whitman National Forest, contact Joe Vacirca, Fisheries Program Manager at 541-523-1265.

The undersized culvert at West Chicken Creek road crossing prior to project implementation.

The undersized round culvert was replaced with this bottomless arch sized to accommodate estimated peak flows.

Willamette National Forest
Lower South Fork McKenzie River

The South Fork is the largest tributary to the McKenzie River and runs approximately 32 miles from its headwaters to its confluence. The lower South Fork opens up into a broad alluvial valley where it meets the McKenzie River. This alluvial valley was once a biological hotspot and is no longer functioning as such due to the construction of Cougar Dam.

The dam has starved the lower South Fork of wood and sediment and levees have straightened and channelized the river. This has increased the transport capacity of the river, meaning that much of the wood, gravel, and fine sediment in the South Fork are frequently transported out of the system.

The temporarily dewatered South Fork channel revealed substrate much too large for spawning.

Soil from onsite being loaded into a haul truck to be transported to fill the incised channel.

Pre-project aerial image of lower South Fork as an incised, primarily single-thread channel.

Large wood being placed in buried logjams and scattered throughout the valley bottom.

As a result, the large wood abundance is very low (less than 10 pieces per mile), the substrate is too large to support fish spawning, and most of the flow is confined to an incised, single-thread channel that is no longer connected to its floodplain. These conditions are severely limiting habitat for native species, including ESA-Threatened Spring Chinook Salmon and Bull Trout.

The overall project will remove up to 54 acres of levees and redistribute that material into currently incised channels to raise the stream bed elevation and reconnect water across the floodplain at base flows. In addition, about 7,000 pieces of large wood will be added to increase habitat complexity and reconnect over 10 miles of historic side channels and 600 acres of active floodplain. Restoring a functioning floodplain will benefit hundreds of native species including ESA-Threatened Spring Chinook Salmon and Bull Trout.

In 2018, Phase I was implemented for about $1.5 million, with one third of the funding coming from partners. This phase of the project restored connectivity to 150 acres of the valley bottom and improved habitat in 5 miles of the river. The project increased large wood frequency in channels and across the floodplain from less than 3 to over 23 pieces per acre. About 90,000 cubic yards of sediment from onsite were redistributed into the incised mainstem channel, followed by the placement of over 3,000 pieces of large wood across the valley bottom. Ecological function and habitat condition has already been vastly improved. Immediately following implementation, the base flow wetted area increased from 8 acres to over 30 acres of complex, high quality aquatic habitat. Within two months following implementation, 14 spring Chinook salmon redds were documented in the Phase I project area, where no redds had been seen before.

For more information on this project and other aquatic restoration projects on the Willamette National Forest, contact Johan Hogervorst, Forest Hydrologist, at 541-225-6430 or Brett Blundon, Forest Fisheries Biologist, at 541-225-6300.

Pre- and post-project aerial images of the Phase I Project Area. Note the dramatic expansion of base flow wetted area and increase in large woody material.

Locations of Forest units in the Pacific Northwest Region of the USDA Forest Service